I/WE CLAIM:

1. An apparatus for providing high availability packet forwarding, comprising:

a service termination card having a packet forwarding engine for receiving and forwarding packets in accordance with a forwarding information base;

a first control processor running a plurality of processes and communicatively coupled to the service termination card;

a second control processor running, asynchronously with respect to the first control processor, a plurality of processes and communicatively coupled to the service termination card;

a first forwarding information base on the service termination card having forwarding information maintained by the first control processor;

a second forwarding information base on the service termination card having forwarding information maintained by the second control processor; and

means for the packet forwarding engine to forward packets in accordance with one of the first and second forwarding information bases depending on an integrity of the processes running on the respective first and second control processors.

2. An apparatus as claimed in claim 1 wherein the service termination card further comprises a heartbeat monitor for determining the integrity of the processes running on the first and second control processors.

3. An apparatus as claimed in claim 2 wherein the heartbeat monitor comprises a table listing the selected processes running on the first control processor and a table listing the selected processes running on the second control processor.

4. An apparatus as claimed in claim 3 wherein the heartbeat monitor is adapted to send heartbeat inquiry messages to the processes listed in the respective tables, and further adapted to conditionally receive heartbeat response messages from the processes, in accordance with the integrity of the respective processes.

5. An apparatus as claimed in claim 1 further comprising an input/output interface through which the first and second control processors receive protocol data units (PDUs) providing information for maintaining the respective first and second forwarding information bases.

6. An apparatus as claimed in claim 1 further comprising an operations and management workstation connected to the respective first and second control processors.

7. An apparatus as claimed in claim 1 wherein the first and second forwarding information bases on the service termination card respectively comprise an Internet protocol forwarding information base.

8. An apparatus as claimed in claim 1 wherein the first and second forwarding information bases on the service termination card respectively comprise a

multi-protocol label switching forwarding information base.

9. An apparatus as claimed in claim 1 further comprising a forwarding information base (FIB) manager that receives FIB information from the first and second control processors and stores the FIB information in a memory of the service termination card.

10. An apparatus as claimed in claim 9 wherein the FIB manager stores primary and backup label switched paths (LSPs) in each of the first and second FIBs so that the primary LSPs in the first FIB are created and maintained by the first control processor and the backup LSPs in the first FIB are created and maintained by the second control processor, while the FIB manager stores the primary and secondary LSPs in a reverse order in the second FIB, to provide line protection for label switched paths.

11. An apparatus as claimed in claim 1 further comprising a bandwidth manager for controlling reservation of local input/output bandwidth between the first and second control processors.

12. An apparatus as claimed in claim 11 wherein the bandwidth manager is communicatively connected to a heart beat monitor that monitors an integrity of process running on the fist and second control processes, and informs the bandwidth manager if one of the control processors is declared out-of-service.

13. An apparatus as claimed in claim 12 wherein the bandwidth manager is adapted to release bandwidth

allocated to the out-of-service control processor so that the bandwidth can be utilized by the in-service control processor.

14. An apparatus as claimed in claim 1 wherein the first and second control processes are respectively adapted to advertise all local interfaces, so that reachability is maintained in a core network in an event that one of the control processors becomes out-of-service.

15. A method of ensuring high availability in a packet forwarding process, comprising:

operating first and second control processors independently and asynchronously to generate and maintain first and second forwarding information bases (FIBs) respectively provided to a service termination card; and

operating the service termination card to forward packets using information from one of the FIBs depending on an integrity of selected processes running on the respective first and second control processors.

16. A method as claimed in claim 15 further comprising a step of dynamically determining the integrity of the selected processes running on the respective first and second control processors.

17. A method as claimed in claim 16 wherein the step of dynamically determining comprises a step of sending heartbeat inquiry messages to each of the selected

processes on the respective first and second control processors.

18. A method as claimed in claim 17 wherein the step of sending further comprises a step of sending the heartbeat inquiry messages from a heartbeat monitor that is operative on the service termination card.

19. A method as claimed in claim 18 further comprising a step of receiving heartbeat response messages from the respective selected processes on the respective first and second control processors.

20. A method as claimed in claim 19 further comprising a step of declaring a one of the control processors out-of-service if a one of the processes running on the one of the control processors fails to return a heartbeat response within a predetermined period of time.

21. A method as claimed in claim 18 further comprising a step of switching to a second FIB if information in the first FIB is being maintained by the control processor declared out-of-service.

22. A method as claimed in claim 21 further comprising a step of switching back to the first FIB if the control processor that maintains the forwarding information in the first FIB is declared to be in-service.

23. A method as claimed in claim 22 wherein the step of switching back is delayed for a predefined period of time to minimize routing loops in a carrier core

network while the first control processor is converging.

24. A method as claimed in claim 15 further comprising a step of installing a new software load on one of the control processors by taking the control processor out-of-service, and permitting the other control processor to continue to maintain forwarding information bases used by the service termination card to forward packets.

25. A method as claimed in claim 24 further comprising a step of installing a new software load on the service termination card while a packet forwarding engine continues to forward packets using one of the forwarding information bases.

26. A method as claimed in claim 25 further comprising a step of returning the one of the control processors to in-service so that it rebuilds and maintains forwarding information bases to be used by the service termination card.

27. A method as claimed in claim 26 further comprising a step of taking the other control processor out-of-service, and permitting the one of the control processors to continue to maintain forwarding information bases used by the service termination card to forward packets.

28. A method as claimed in claim 15 wherein when a service termination card is advised that one of the control processors it out-of-service, the method further comprises a step of

erasing all original content of the FIB when one of a timeout has expired, and a remaining in-service control processor has relearned and distributed the same routes that a FIB manager of the service termination card has already installed.

29. A method as claimed in claim 28 further comprising a step of continuing to use original routes for IP multicast when the control processor becomes out-of-service for a period of time, or after a same set of routes are relearned by the in-service control processor.